



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/560,073

12/09/2005

Takashi Masuko

1204.45684X00

9636

20457 7590 03/27/2008
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

DESAI, ANISH P

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

03/27/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,073	Applicant(s) MASUKO ET AL.	
	Examiner ANISH DESAI	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 3,8,10-14,21-24 and 27-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,9,15-20,25 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/09/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I claims 1-20 and 24-26 directed to an adhesive film and species of epoxy resin is solid at room temperature, polyamide resin obtained by reacting an acid dianhydride...polyimide resin, and phenol based epoxy curing agent in the reply filed on 12/13/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Accordingly, claims 1, 2, 4-7, 9, 15-20, 25, and 26 are examined. Claims 3, 8, 10-14, 21-24, and 27-32 are withdrawn.

Claim Objections

2. Claim 26 is objected to because of the following informalities: the phrase "any one of claims 16" does not make sense at all. "Any one of" is preferably removed from the claim for avoiding indefiniteness. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim recites the difference between the surface energy of the adhesive film and surface energy of an organic substrate. It is noted that the

Art Unit: 1794

invention is directed to an adhesive film, therefore it is not clear whether the organic substrate is a component of the adhesive film or not. For the purpose of the examination, the organic substrate is not considered to be part of the structure of the adhesive film.

Claim Rejections - 35 USC § 102 or 103

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takeda et al. (US 2001/0035533A1).
5. Takeda teaches a semiconductor chip that is attached to a lead frame with a filmy organic die-bonding material (an adhesive film) (abstract). Further, the filmy die-bonding material of Takeda is formed by dissolving polyimide resin and epoxy resin (0019, Examples 1-2).
6. Given that Takeda discloses what has been set forth above with respect to claim 1, except for the properties of SP value of polyimide, tan delta peak temperature of adhesive film, and a flow amount. It is reasonable to presume that said properties are present in the invention of Takeda. Support for said presumption is based on the fact

that the adhesive films of Takeda and Applicant comprise polyimide resin and epoxy resin. Therefore, the presently claimed properties would be present. The burden is shifted to Applicant to prove it otherwise (*In re Fitzgerald*, 205 USPQ 594). In addition, the presently claimed properties would obviously have been present once the adhesive film of Takeda is provided (see *In re Best*, 195 USPQ at 433, footnote 4 CCPA 1977).

7. Claims 1, 2, 4-7, 9, 15, 16, 19, and 20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takashi et al. (JP 11-140386, Machine translation provided by the Examiner).

8. Regarding claim 1, Takashi teaches an adhesive film that is obtained by mixing polyimide resin and epoxy resin (abstract).

9. Given that Takashi discloses what has been set forth above with respect to claim 1, except for the properties of SP value of polyimide, tan delta peak temperature of adhesive film, and a flow amount. It is reasonable to presume that said properties are present in the invention of Takashi. Support for said presumption is based on the fact that the adhesive films of Takashi and Applicant comprise polyimide resin and epoxy resin. Additionally, Applicant and Takeshi disclose that polyimide resin can be formed by reacting tetracarboxylic acid dianhydride and diamine (0031 of US PG PUB 2007/0098995A1 of this application and 0021 of Takashi). Moreover, the tetracarboxylic acid dianhydride taught by Applicant and Takeshi are similar (see Applicant's formula IX in 0032 of the aforementioned PG PUB and Formula 3 on page 5 of Takeshi). Further, diamine used in formulation of polyimide of Applicant and Takeshi are similar (see 0036

Art Unit: 1794

of the aforementioned PG PUB including Formula II, and 0029 of Takeshi disclosing aliphatic diamine such as 1, 5 diaminoethane etc.). Moreover, Applicant and Takeshi disclose use of similar solid epoxy resins (see Table 2 disclosing ESCN 195-solid epoxy in aforementioned PG PUB and 0037 and page 12 of Takeshi disclosing ESCN-195 epoxy). Thus, the presently claimed properties would be present. The burden is shifted to Applicant to prove it otherwise (*In re Fitzgerald*, 205 USPQ 594). In addition, the presently claimed properties would obviously have been present once the invention of Takeshi is provided (see *In re Best*, 195 USPQ at 433, footnote 4 CCPA 1977).

10. Regarding claim 2, Applicant and Takeshi disclose use of similar solid epoxy resins (see Table 2 disclosing ESCN 195-solid epoxy in aforementioned PG PUB and 0037 and page 12 of Takeshi disclosing ESCN-195 epoxy).

11. Regarding claim 4, 0045 of Takeshi discloses use of 2-50 wt% of thermosetting resin [epoxy] to 100 weight% of thermoplastic [polyimide].

12. With respect to claim 5, the recitation of "a polyimide resin obtained by reacting an acid dianhydride... and diamine" is product by process limitation. The product by process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. "Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). Once the

Art Unit: 1794

Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

13. In the instantly claimed subject matter, both Applicant and Takeshi disclose adhesive film containing a polyimide resin. Thus, the polyimide resin of Takeshi and that of Applicant are similar. As to the weight% of diamine, it is noted that while Takeshi does not explicitly disclose weight% of diamine, but Takeshi discloses general conditions of claim specifically an adhesive film containing polyimide resin as claimed. Therefore, it would have been obvious to select weight% of diamine as claimed, motivated by the desire to form polyimide resin.

14. With respect to claims 6 and 7, Takeshi discloses a phenol-based hardening (curing) agent that has 2 or more hydroxyl groups and molecular weight of 400-1500 (0039). As to claim 9, Takeshi does not explicitly an equivalent ratio of epoxy equivalent of the epoxy resin (B) and an OH equivalent of the epoxy curing agent (C), as previously noted the epoxy resin and the epoxy curing agent of Takeshi and Applicant are similar. Therefore, it is reasonable to presume that the aforementioned equivalent ratio would be present in the invention of Takeshi.

15. Regarding claims 15 and 16, Takeshi discloses the adhesive film containing filler such as rubber based filler (e.g. butadiene styrene) (see 0018).

16. As to claims 19 and 20, although Takeshi does not teach claimed properties of the difference between the surface energy of the adhesive film and surface energy of an organic substrate, and peeling force of the adhesive film, it is reasonable to presume that said properties are present in the invention of Takeshi. The support for said presumption is based on the same reasons as set forth with respect to claim 1 above.

17. Claims 17, 18, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takashi et al. (JP 11-140386, Machine translation provided by the Examiner).

18. Takeshi discloses claimed invention except for the average and maximum particle diameter of the filler and amount of the filler. It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the particle diameter of the filler and the amount of the filler in the invention of Takashi, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in the art (*In re Aller*, 105 USPQ 233). In the instantly claimed invention Takashi discloses an adhesive film containing polyimide resin, epoxy resin, and a filler. Therefore, selecting a proper diameter and weight% of filler would have been obvious, motivated by the desire to optimize the dispersion of the filler in the aforementioned resin, thereby enhancing the strength of the adhesive film.

Conclusion

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANISH DESAI whose telephone number is (571)272-6467. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. D./
Examiner, Art Unit 1794

/Hai Vo/
Hai Vo
Primary Examiner, Art Unit 1794